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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LOBO, IAN J

ART UNIT PAPER NUMBER

3662

DATE MAILED: 01/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/070,228	<b>Applicant(s)</b> LAWS ET AL.	
	<b>Examiner</b> Ian J. Lobo	<b>Art Unit</b> 3662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 November 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 11-18, 21 and 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 19, 20 and 23-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

### **DETAILED ACTION**

1. This application contains claims 11-18, 21 and 22 drawn to an invention nonelected with traverse in the action ,mailed August 30, 2004. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-8, 19, 20, 23, 25 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one of the PCT application to Bouyoucus ('452) or US patents to Barber et al ('404), Yang ('176) when taken in view of Sallas ('668) and Barr ('306).

4. Claims 1 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ray ('061) or Manin ('754) when taken in view of Sallas ('668) and Barr ('306).

5. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huizer ('956) when taken in view of Sallas ('668) and Barr ('306).

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6. Claims 1-10, 19, 20, 23, 24, 25 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the UK application to Lugg ('503A) when taken in view of Sallas ('668) and Barr ('306).

7. Claims 1-8, 19, 20, 23 and 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haugland et al ('180) when taken in view of Barr ('306) and Sallas ('668).

Per claims 1, 2, 3, 6, 7, 8, 25 and 29 see Bouyoucus, figures 8, 11 and 22.

Per claims 4 and 5, see Bouyoucus, col. 6, lines 42-51.

Per claims 19, 20 and 23, see Bouyoucus, col. 2, lines 31-54.

Similarly, with respect to Haugland et al, see col. 3, line 58 – col. 4, line 14 and col. 5, line 54 – col. 6, line 11.

With respect to Barber et al, see col. 3, line 62 – col. 4, line 21, col. 4, line 61 – col. 5, line 48, and col. 8, lines 2-10.

With respect to Lugg, see col. 1, lines 9-23 and 49-64, and col. 2, lines 66-89, 118-123.

With respect to Yang, see Figs. 1 and 2, col. 2, lines 22-51, and col. 4, lines 10-24.

With respect to the rejections of the above claims over the patents to Manin, Ray and Huizer, applicant is referred to the PCT search report and International Preliminary Examination report.

The difference between the above noted prior art and independent claims 1, 6 and 25 is the claims specify use of "marine vibrators" and emit the seismic energy "during a sweep" and the above noted references disclose use of air guns, water guns and sparkers. Thus, the difference between the instant claims and the references noted above lies in the type of marine seismic sources used.

Barr (col. 1, lines 39-48) and Sallas (col. 1, lines 20-38) each discloses that in marine seismic surveying air guns and marine vibrators are commonly used as energy sources. Marine vibrators, with their concomitant sweep technology, tend to produce pressure pulses that have a broad band frequency spectra and air guns tend to produce pressure pulses with a narrow band frequency spectra. Sallas teaches that although air guns are very popular as seismic energy sources, environmentalists prefer marine vibrators over air guns because air guns are harmful to marine life.

Therefore, in view of the well known use of air guns and marine vibrators as seismic energy sources in the marine environment, and the preference for marine vibrators over air guns, especially to environmentalists, it would be obvious to one of ordinary skill in the art to substitute a marine vibrator for the air guns of Bouyousus et al, barber et al, Yang, Lugg, Manin, Ray, Huizer or Haugland et al.

It is noted that claims 26-28 claim the functional relationship between vibrator depth and wavelengths of the emitted energy. Haugland et al teaches (col. 5, line 54+) the relationship between emitted frequency and vibrator depths is controllable. In as much as the frequency is an inverse wavelength relationship, it is obvious to one of ordinary skill in the art that the claimed relationship between wavelength and vibrator

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depths is (a) known to one of ordinary skill in the art as shown by Haugland et al's frequency/depth relationship and (b) of a design choice (claims 27, 28) that one of ordinary skill in the art would find obvious.

8. Claims 9, 10 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bouyoucus, Haugland et al, Yang or Barber et al as applied to claims 1, 6, 8, 19 and 23 above, and further in view of Lugg et al ('503A).

Claims 9, 10 and 24 further differ over the above noted patents by claiming specific depths and arrangements for the marine vibrators.

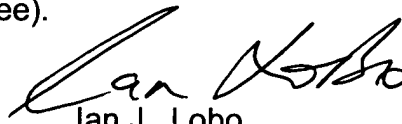
However, the specific spacing depths and arrangements are of a design choice that one of ordinary skill in this art would find obvious since applicant has not disclosed that the specific depths and arrangement of vibrators claimed provides an advantage or solves a stated problem. Lugg, for instance, on page 2, lines 18-22, teaches that the specific depths chosen were through a computer synthesis of combinations of time signals and computed Fourier transforms to achieve the most satisfactory waveform. Thus, although the prior art does not specifically disclose the depths and arrangements of vibrators claimed, the prior art knows that such factors as depths and the combinations and arrangements of vibrators are factors that affect the waveform output of the arrays. The depths and arrangements are, therefore, known to be a result dependent variable. Skill is presumed to be possessed by the artisan. Determining the optimum values of result effective variables (depths and combinations of vibrators) would have been obvious and ordinarily within the skill of the artisan.

***Response to Arguments***

9. Applicant's arguments with respect to claims 1, 6 and 25 have been considered but are moot in view of the new ground(s) of rejection.
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian J. Lobo whose telephone number is (703) 306-4161. The examiner can normally be reached on Monday - Friday, 6:30 - 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas H. Tarcza can be reached on (703) 306-4171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Ian J. Lobo  
Primary Examiner  
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